STAR
Research Journal

Available online at www.starresearchjournal.com (Star International Journal)
SOCIAL STUDIES
Star. Soc. Stud 1 ***(2015)***

EFFECT OF WEIGHT TRAINING AND SPECIFIC AEROBIC TRAINING ON SELECTED PHYSIOLOGICAL VARIABLES OF MEN FIELD HOCKEY PLAYERS

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Abstract

The purpose of the study was to find out the effect of weight training and specific aerobic training on selected physiological variables of men field hockey players. To achieve this purpose of the study forty-five men field hockey players were selected studying Bachelor's degree in the Department of Physical Education and Sports Sciences, Thanthai Hans Roever College from Perambalur, Tamil Nadu, India at randomly. They were divided into three equal groups of each fifteen players as weight training group (Group I), specific aerobic training group (Group II) and act as control group (Group III). Group I and II were underwent their respective training programme for three days per week for twelve weeks who did not underwent any special training programme apart from their regular physical education curriculum. The following physiological variables such as resting pulse rate and vital capacity were selected as criterion variables. The resting pulse rate was assessed by taking radial pulse rate and vital capacity was assessed by using wet spirometer. All the subjects of three groups were tested on selected criterion variables at prior to and immediately after the training programme as pre and post test selected. Analysis of covariance (ANCOVA) was used to find out the significant difference if any, among the groups on each selected criterion variables separately. In all the cases, .05 level of confidence was fixed to test the significance, which was considered as an appropriate. There was a significant difference among weight training group, specific aerobic training group and control group on physiological variables among resting pulse rate and vital capacity.

Keywords: *weight training, specific aerobic training, physiological, resting pulse rate, vital capacity, field hockey.*

INTRODUCTION

Today's sports persons are breaking records that many thought were untouchable-in large part due to the major advances in sports training. High-Performance Sports Conditioning combines these superior modern methods with sample training programs, workouts, and drills to serve. A sport is the far most accepted way to keep you healthy directly. We all know that. We are going to have a close look at the phenomenon, which lies behind sports. These include the physical, psychological benefits of sports, ways to get fitter and a brief explanation of our muscle structure. After going through those topics, we are confident that you can gain some tips on how to train yourself up in a more systematic way. Or at the very least, you can know how sports can help you to do more. So they say "Sports can keep you physically healthy". We bring you the bolts and nuts of the physical benefits that sports brought about. Sports can improve the components of fitness, namely: Strength, speed, skill, stamina, and suppleness. Sports can burn calories. Sports can affect your appetite. Among the many physiological variables, the researcher has selected variables such as Resting Pulse Rate and Breath Holding Time as they play an important role in sports performance.

In intensive care, physiological variables of the critically ill are measured and recorded in short time intervals. The proper extraction and interpretation of the essential information contained in this flood of data can hardly be done by experience alone. Typically, decision making in intensive care is based on only a few selected variables. Alternatively, for a dimension reduction, statistical latent variable techniques like principal component analysis or factor analysis can be applied. However, the interpretation of latent variables extracted by these methods may be difficult. A more refined analysis is needed to provide suitable bedside decision support.

Graphical models based on partial correlations provide information on the relationships among physiological variables that is helpful for variable selection and for identifying interpretable latent components. In a comparative study we investigate how much of the variability of

the observed multivariate physiological time series can be explained by variable selection, by standard principal component analysis and by extracting latent components from groups of variables identified in a graphical model.

High level of performance of football and volley ball players might be dependent upon their physiological make up. It was recognized that physiological proficiency was needed for high-level performance. Hence resting pulse rate and breath holding time were selected as physiological components for this investigation. For specific physiological systems of the body to be fit, they must function well enough to support the particular game the players are playing. Since different games make different demands upon the organism with respect to neurological, respiratory, circulatory and temperature functions, physiological fitness is specific to the activity, physiological systems are highly adaptive to exercise. The response of each system is distinctive, for example, hard work in the heat is necessary to improve the fitness of the temperature regulation mechanism. Each task has its major physiological components and fitness for the task requires effective functioning of appropriate systems, (Shaver, 1981). Resting pulse rate the average resting heart rate for an adult is between 60 and 100 beats per minute, while well-conditioned athletes can achieve between 40 and 60 beats per minute. The maximum pulse rate is 220 minus your age, and the target for a healthy pulse rate during, or just after exercise, is 60-80 per cent of this.

Normal pulse rate for an adult is between 60 to 100 beats per minute resting. Pulse rate is one of the indicators of the health of your heart. The regularity of the pulse, strength of the pulse, blood pressure, and ECG readings all relate to the health of the heart. Generally, under normal circumstances, the lower the resting rate, the stronger the heart, because it means the heart is pumping so efficiently that it needs less beats to circulate the same amount of O2. (It also means your blood carries more red blood cells.) Pulse rate is the number of beats felt exactly for a minute. The average rate of the pulse in a healthy adult is 72 beats per minute. There may be variation of up to five beats per minute within normal range, (Shaver, 1981). The pulse rate varies greatly in different people and in the same person under different situations. The American Heart Rate Association accepts as normal, a range from 50 to 100 beats per minute. Some endurance athletes with very strong and efficient hearts have rate as low as 45 beats per minute. Eugene Bannisher, the great miller, had a resting pulse rate of only 38 beats per minute. Women heart takes 5-10 beats faster than men. This is primarily due to their size. The average rate is 72 beats per minute but the rate can accelerate to 220 per minute, (Shaver, 1981). Regular participation in endurance activity such as jogging, cycling and distance swimming can be done to reduce the pulse rate. Good Cardio respiratory condition would be indicated by pulse rate of 60 for women and 50 for men. Lesser pulse rate gives good performance for all the sports and games.

METHODOLOGY

The purpose of the study was to find out the effect of weight training and specific aerobic training on selected physiological variables of men field hockey players. To achieve this purpose of the study forty-five men field hockey players were selected studying Bachelor's degree in the Department of Physical Education and Sports Sciences, Thanthai Hans Roever College from Perambalur, Tamil Nadu, India at randomly. They were divided into three equal groups of each fifteen players as weight training group (Group I), specific aerobic training group (Group II) and act as control group (Group III). Group I and II were underwent their respective training programme for three days per week for twelve weeks who did not underwent any special training programme apart from their regular physical education curriculum. The following physiological variables such as resting pulse rate and vital capacity were selected as criterion variables. The resting pulse rate was assessed by taking radial pulse rate and vital capacity was assessed by using wet spirometer. All the subjects of three groups were tested on selected criterion variables at prior to and immediately after the training programme as pre and post test selected. Analysis of covariance (ANCOVA) was used to find out the significant difference if any, among the groups on each selected criterion variables separately. In all the cases, .05 level of confidence was fixed to test the significance, which was considered as an appropriate. There was a significant difference among weight training group, specific AEROBIC training group and control group on physiological variables among resting pulse rate and vital capacity.

TRAINING PROGRAMME

During the training period, group I underwent weight training programme, group II underwent specific aerobic training programme, for three days per week for twelve weeks in addition to their regular physical education activity, every day workout lasted about 45-60 minutes including warm-up and warm down exercises. Group III acted as control who did not participate any specific training, however, they per-form regular physical education programme.

STATISTICAL ANALYSIS

The data was collected from three groups at prior to and after completion of the training period on selected criterion variables, were

statistically examined for significant difference if any, by applying analysis of covariance (ANCOVA). The Scheffe's post hoc test was applied to know the significant difference between groups, if they obtained 'F' ratio was significant. In all cases .05 level of confidence was utilized to test the significance.

RESTING PULSE RATE

The analysis of covariance of the data obtained for Resting pulse rate of pre-test and post-test of weight training group and specific aerobic training group and control group have been presented in Table I.

TABLE I.
ANALYSIS OF COVARIANCE FOR THE PRE AND POST TEST SCORES ON RESTING PULSE RATE OF WEIGHT TRAINING GROUP SPECIFIC AEROBIC TRAINING GROUP AND CONTROL GROUP

Test	Weight Training Group	Specific Aerobic Training Group	Control group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F' Ratio
Pre Test								
Mean	71.26	71.33	71.46	Between	0.31	2	0.15	0.17
S.D.	0.88	0.89	1.06	Within	38.00	42	0.90	
Post Test								
Mean	67.66	65.06	71.06	Between	271.60	2	135.80	96.34*
S.D.	1.29	1.27	0.96	Within	59.20	42	1.41	
Adjusted Post Test								
Mean	67.67	65.06	71.05	Between	268.94	2	134.47	93.99*
				Within	58.69	41	1.43	

* Significant at .05 level of confidence.

(The table values required for significance at .05 level of confidence for 2 and 42 and 2 and 41 are 3.22 and 3.23 respectively).

Table I shows that the pre-test means on Resting pulse rate of weight training group, specific aerobic training group and control group are 71.26 ± 0.88, 71.33 ± 0.89 and 71.46 ± 1.06 respectively. The obtained 'F' ratio value 0.17 is less than the required table value 3.22 for 2 and 42 at 0.05 level of confidence on Resting pulse rate. The post-test means on Resting pulse rate of weight training group, specific aerobic training group and control group are 67.66 ± 1.29, 65.06 ± 1.27 and 71.06 ± 0.96 respectively. This obtained 'F' ratio value 96.34 is greater than the required table value 3.22 for 2 and 42 at 0.05 level of confidence on Resting pulse rate. The adjusted post-test means on Resting pulse rate of weight group, specific aerobic training group and control group are 67.67, 65.06 and 71.05 respectively. This obtained 'F' ratio value 93.99 for adjusted post-test is greater than the required table value 3.23 for 1 and 42 at 0.05 level of confidence on Resting pulse rate. The results of the study indicated that there was a significant difference between the adjusted post-test means of weight training group, specific aerobic training group and control group on Resting pulse rate. Since, three groups were compared, whenever the obtained 'F' ratio for adjusted post test was found to be significant, the Scheffe's test to find out the paired mean differences and it was presented in Table I.

TABLE II.
THE SCHEFFE'S TEST FOR THE DIFFERENCE BETWEEN PAIRED MEANS ON RESTING PULSE RATE

Weight Training Group	Specific Aerobic Training Group	Control group	Mean Differences	Confidence Interval Value
67.67	65.06	-	2.61*	0.55
67.67	-	71.05	3.38*	0.55
-	65.06	71.05	5.99*	0.55

*Significant at 0.05 level of confidence.

The table II shows that the mean difference values between weight training group and specific aerobic training group, weight training group and control group, specific aerobic training group and control group are 2.61, 3.38 and 5.99 respectively on resting pulse rate which were greater than the required confidence interval value of 0.55 significance. The results of this study showed that there was a significant difference between weight training group and specific aerobic training group, weight training group and control group and specific aerobic training group and control group on resting pulse rate.

VITAL CAPACITY

The analysis of covariance of the data obtained for vital capacity of pre-test and post-test of weight training group and specific aerobic training group and control group have been presented in Table III.

TABLE III.
ANALYSIS OF COVARIANCE FOR THE PRE AND POST TEST SCORES ON VITAL CAPACITY OF WEIGHT TRAINING GROUP SPECIFIC AEROBIC TRAINING GROUP AND CONTROL GROUP

Test	Weight Training Group	Specific Aerobic Training Group	Control group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F' Ratio
Pre Test								
Mean	3.49	3.49	3.52	Between	0.005	2	0.003	1.63
S.D.	0.03	0.04	0.03	Within	0.066	42	0.002	
Post Test								
Mean	3.66	3.81	3.51	Between	0.64	2	0.32	148.10*
S.D.	0.04	0.05	0.04	Within	0.09	42	0.00	
Adjusted Post Test								
Mean	3.66	3.81	3.51	Between	0.63	2	0.31	147.49*
				Within	0.08	41	0.02	

* Significant at .05 level of confidence.

(The table values required for significance at .05 level of confidence for 2 and 42 and 2 and 41 are 3.22 and 3.23 respectively).

Table III shows that the pre-test means on vital capacity of weight training group, specific aerobic training group and control group are 3.49 ± 0.03, 3.49 ± 0.04 and 3.52 ± 0.03 respectively. The obtained 'F' ratio value 1.63. is less than the required table value 3.22 for 2 and 42 at 0.05 level of confidence on vital capacity. The post-test means on vital capacity of weight training group, specific aerobic training group and control group are 3.66 ± 0.04, 3.81 ± 0.05 and 3.51 ± 0.04 respectively. This obtained 'F' ratio value 148.10 is greater than the required table value 3.22 for 2 and 42 at 0.05 level of confidence on vital capacity. The adjusted post-test means on vital capacity of weight training group, specific aerobic training group and control group are 3.66, 3.81 and 3.51 respectively. This obtained 'F' ratio value 147.49 for adjusted post-test is greater than the required table value 3.23 for 1 and 42 at 0.05 level of confidence on vital capacity. The results of the study indicated that there was a significant difference between the adjusted post-test means of weight training group, specific aerobic training group and control group on vital capacity. Since, three groups were compared, whenever the obtained 'F' ratio for adjusted post test was found to be significant, the Scheffe's test to find out the paired mean differences and it was presented in Table IV.

TABLE - IV
THE SCHEFFE'S TEST FOR THE DIFFERENCES BETWEEN PAIRED MEANS ON VITAL CAPACITY

Weight Training Group	Specific Aerobic Training Group	Control group	Mean Differences	Confidence Interval Value
3.66	3.81		0.15*	0.07
3.66		3.51	0.15*	0.07
	3.81	3.51	0.30*	0.07

"Significant at 0.05 level of confidence.

The table IV shows that the mean difference values between weight training group and specific aerobic training group, weight training group and control group, specific aerobic training group and control group, 0.15, 0.15 and 0.30 respectively on vital capacity which were greater than the required confidence interval 0.07 significance. The results of this study showed that there was a significant difference between weight training group and specific aerobic training group, weight training group and control group, specific aerobic training group and control group on vital capacity.

CONCLUSION

The following conclusions were drawn from the results of the study.

1. There was a significant difference among weight training group, specific aerobic training group and control group on resting pulse rate.
2. There was a significant difference among weight training group, and specific aerobic training group and control group on vital capacity.
3. There was a significant difference improvement on among weight training group, specific aerobic training group and control group, on resting pulse rate and vital capacity.

REFERENCES

1. Backet Tom, "Interval Training" "Athletic Journal vol.46. December 1963.
2. Bompa,Tdor O.Periodation of Strength (Veritas Publishing Inc.Canada-1996).
3. Burgomaster, ka., heigenhauser, g j., and gibala, m j., "Effect Of Short Term Sprint Interval Training On Human Skeletal Muscle Carbohydrate Metabolism During Exercise And Time Trial Performance". Appl physical, 100:6, (2006).
4. Clarke and Clarke, "Application of Measurement of Physical Education, Saint Louis; Mosby year boom inc., 1986.
5. Dupont g.,et al., "The Effect Of In Season, High Intensity Interval Training In Soccer Players", Journal Of Strength Conditioning Research,18:3, (2004).
6. Edge,jetal; "Effect Of High And Moderate-Intensity Training On Metabolium And Repeated Sprinters", Medicine And Swenca In Sports And Exercise 37:11(2005).

7. Hunthegn. H.G., "Physical Conditioning through Interval Training Medicine and Science in Sports", 5,4 (November1973)
8. Kotgamanidis,c.,el.al., "The Effect Of Combined High Intensity Strength And Speed Training Program On The Running And Jumping Ability Of Soccer Players", J Strength Cond Res (2005).
9. Prentice E. Willeam, "Rehabilitation Techniques in Sports Medicine" (2ed) Saint Louis: Mosby year book inc. 1994
10. Sing Hardayal. "Sports Training and General Theory Methods", Patiala NIS bublation 1984.
11. Uppal Arun Kumar, "Comparative Effective of Slow and Interval Running Methods on Medical Oxygen Uptake" Research Quarterly1:2 (August 1982.